Chapter 4: Layer Properties

In this Exercise:

- Working with Layer Properties – Symbols
- Editing Data
- Drawing Features using Graduated Symbols

Working with Layer Properties - Symbols

Data layers that have been added to the project file, and are found in the Table of Contents, are automatically displayed using symbols (for points, lines and polygons) and colors.

Decisions that control how data layers are symbolized involve choosing colors and styles that best represent features on the map and improve visibility.

1. **Create a New QGIS Project**

    a) Open QGIS

    b) Set the Coordinate Reference System to VT State Plane NAD 83 (Meters). In the lower right corner of the project screen your should see "EPSG:32145".

2. **Add Data to Your Project**

    a) Click on the add vector data icon to add the following data layers to your project:

         ii. TRANS_AIRPORTS_POINT
         iii. TRANS_RDSMAJ1_LINE
         iv. BOUNDARY_TWNBNDS_POLY

    b) Arrange your layers in an order that makes them all visible
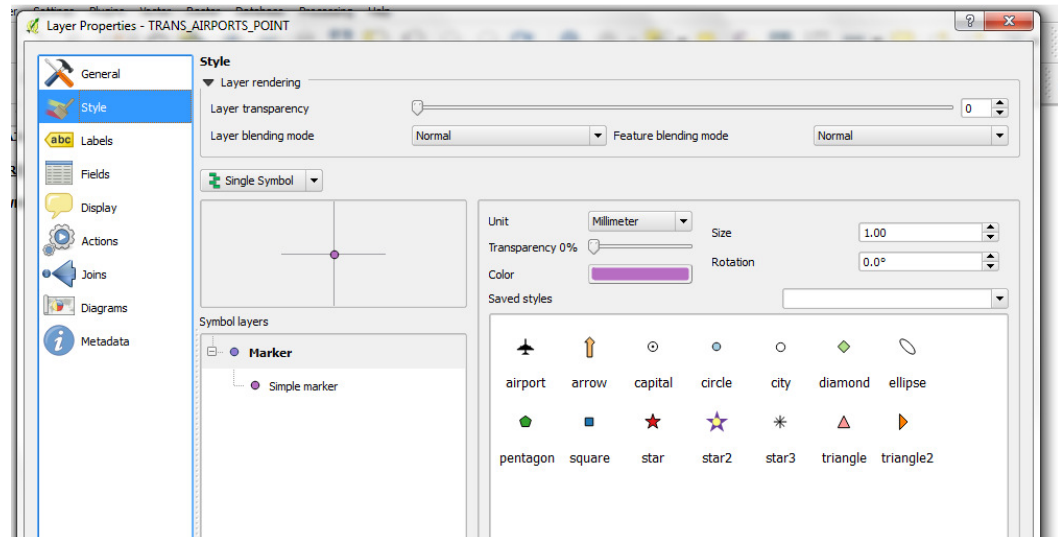
3. Changing Values in the Layer Properties Window

To view Layer Properties

a) In the Table of Contents, right-click on the Airports data layer
b) Click to select Properties
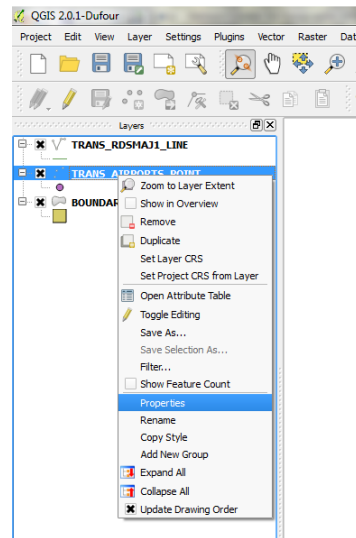
The Properties window will default to show properties for Style (if it doesn't, look for the tab called Style)


The Airport layer has, by default, been set to Single Symbol, Circle, and a default color.

To change symbology for this layer:

a) Change the following:

   i. Change the symbol to a Triangle by clicking on the triangle in the lower right box

   ii. Set the size of the Point Symbol to 4.

   iii. Change the Fill color to Red (click on the color swatch, then click on a red of your choice, then click OK).
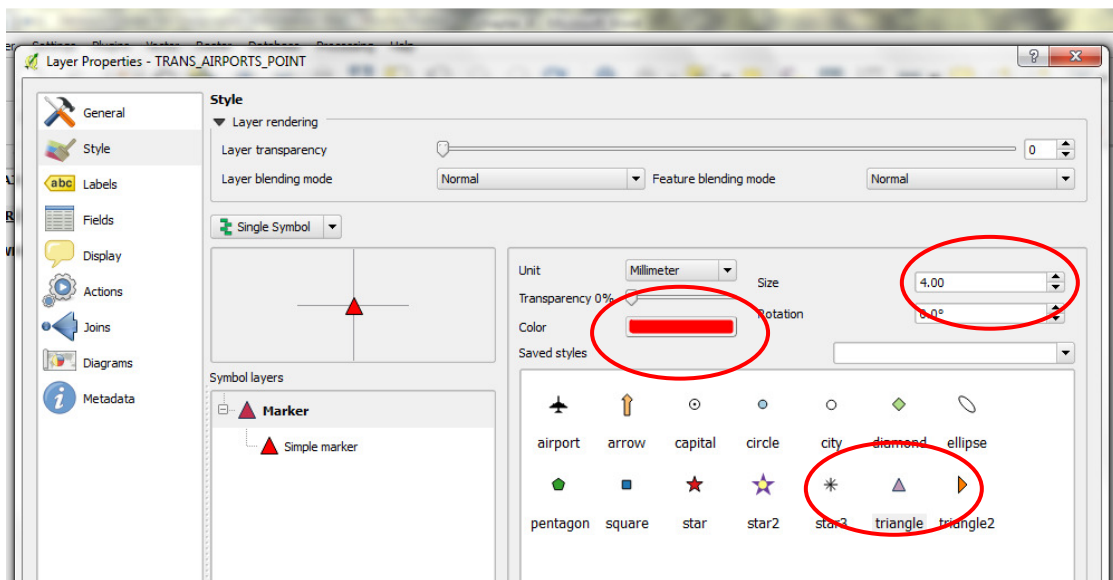
b) Click [OK] to accept changes and close the Layer Properties window.

Note: Clicking on [Apply] will apply changes to the map but will leave the property window open.

This is helpful when you are experimenting with changes and how they appear on the map.

The Table of Contents and Map should now show new symbology for your point layer as a red triangle.

4. Changing Symbology: Improving the Appearance of the Map

To improve the visibility of data layers and the appearance of the map we need to change symbology for the remaining data layers.

a) In the Table of Contents, right-click on the Roads data layer

b) Click to select Properties

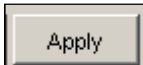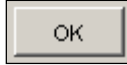c) Click on one of the "saved styles" or pick a color by clicking on the color swatch
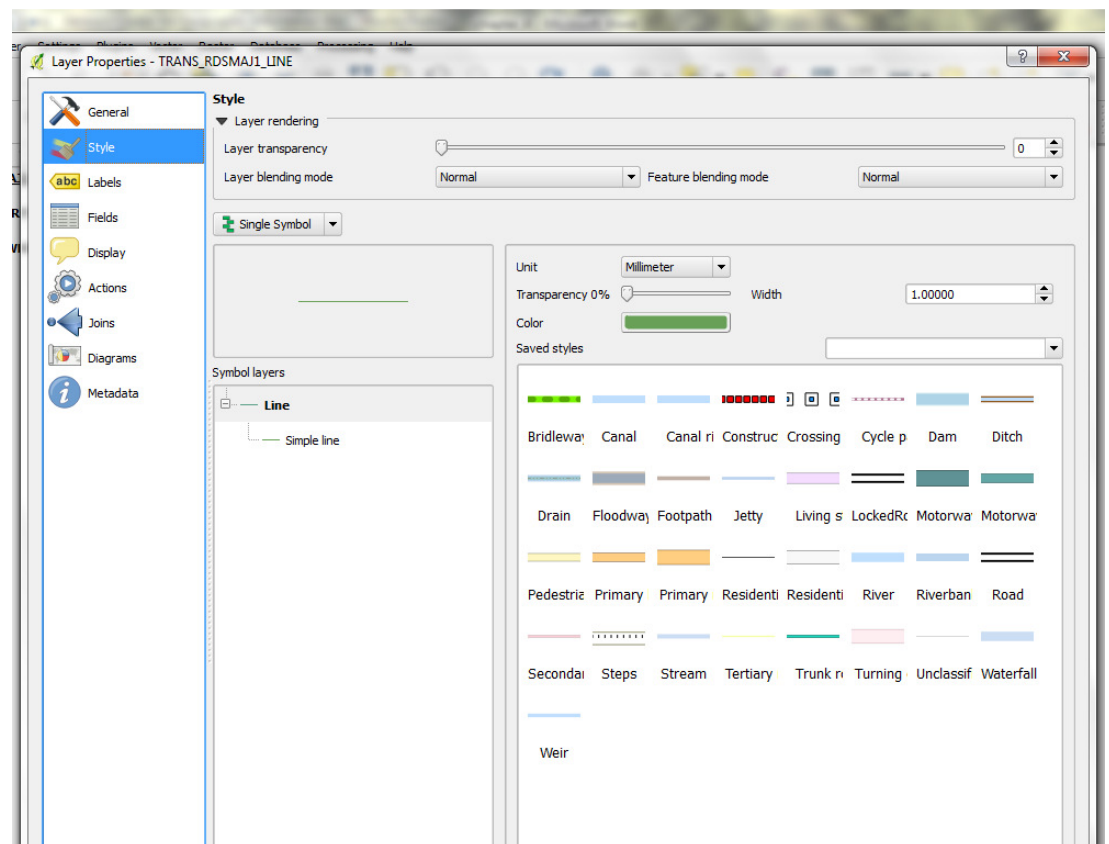
d) If you click on the color swatch, you will open up the Select Color Window.

e) You can pick a swatch here, or create a custom color using RGB values, hue, sat, val, values or using the prism.
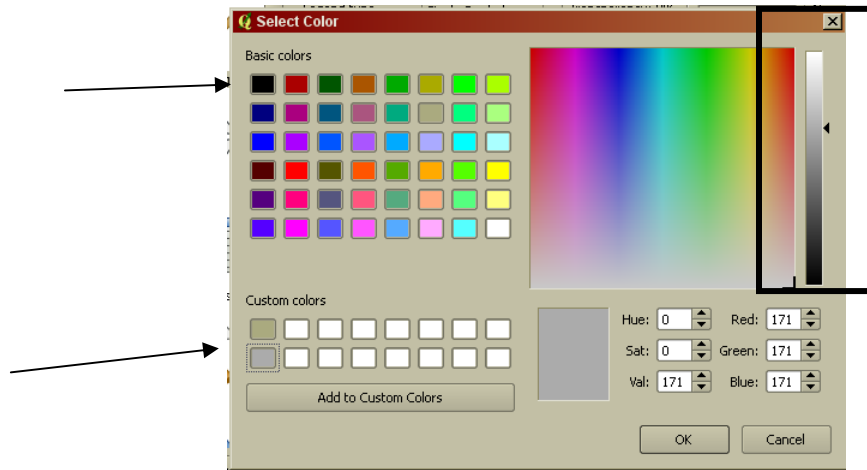
f) Click "Add to Custom Colors" and then click on that custom swatch.

g) Click "OK"

h) Click [Apply] to accept changes followed by [OK] to close the window.

i) Open the layer properties window for the data layer

   BOUNDARY_TWNBNDS_POLY (Town Boundaries)

j) Click on Fill and then Simple Fill in the Symbol Layers box to change the box on the right into an edit fill box
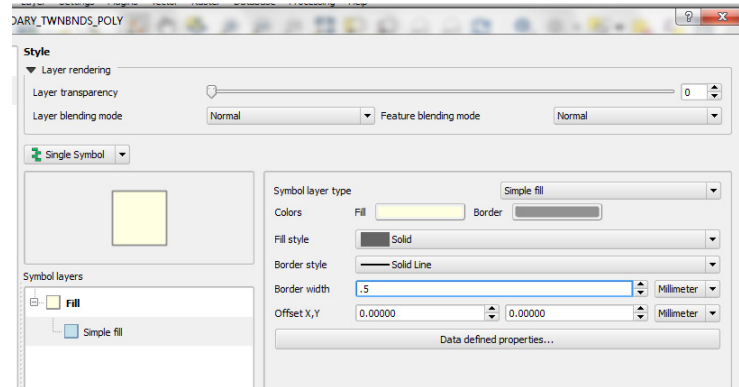
k) Change the Fill color by clicking on the fill color swatch

l) Put the following numbers in the Red, Green, and Blue values: 255, 255, and 225. You should end up with a pale yellow.

m) Change the Border color to grey by clicking on the black swatch and then pushing the prism pointer up a bit.
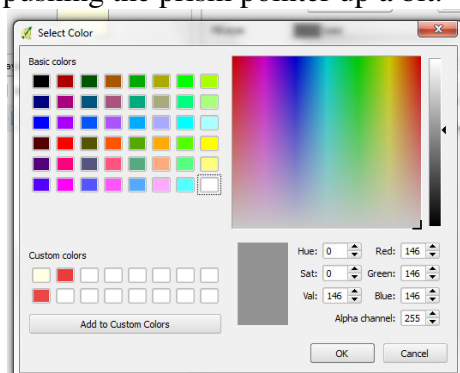
n) Change the Border thickness to a higher number (like .5)

o) Click OK again to accept changes

p) Evaluate the changes you have made and edit as you prefer!

q) Change the order of the data layers if it improves the appearance of the map.

The Map View should now display a map that more clearly shows the data layers in our project file.

7. Drawing Features Using Categorized Symbols

For some data layers it is useful to draw features with Categorized Symbols rather than using a Single Symbol as in the steps outlined above.

For example, it is possible to display any of our data layers using a unique symbol depending on the descriptive data associated with the data layer.

> Note: Data associated with spatial features in the geographic data files is commonly referred to as Attribute Data or simply Attributes. Attributes are discussed in **Chapter 5: Understanding and Using Attribute Data, Queries and Analysis**.
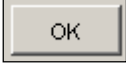
A simple example allows us to apply Categorized Values to the data you have created and added to your map following the steps outlined below.

a) In the Table of Contents, right-click on the Airports data layer

b) Click to select "Properties"

In the upper left corner of the Layer Properties Window change the drop down menu to Categorized and Set the Column drop down to MISC
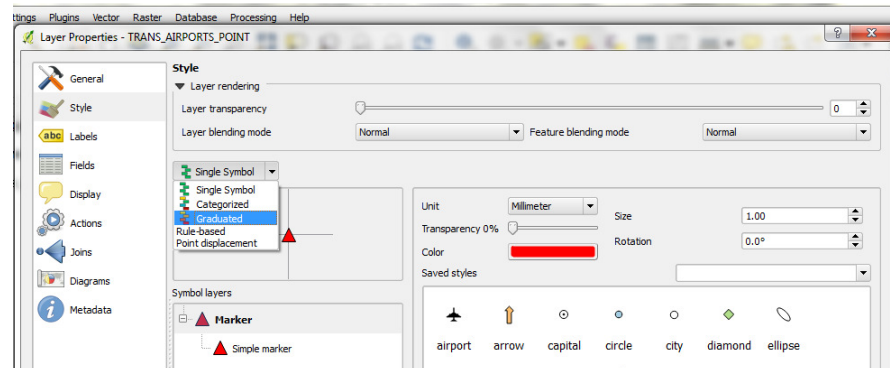
c) Set the symbol and Color Ramp as you would like them to be
d) Click Classify
e) If you prefer not to have the color values go from low value to high (a ramp) you can double click on each symbol to change symbol, size and color as you wish

f) Click [Apply] and then [OK] to apply changes and close the Properties window.

The goal of the above steps has been to adjust **symbology**.

We have also displayed more information on the map than when we began! Save your project and open a new blank project.

8. Drawing Features using Graduated Symbols

Categorized Symbols are appropriate when displaying data layers that have discrete, or distinct, categories. Graduated Symbols are used to display features that have continuous data values such as population.

a) Open QGIS, set the CRS to VT State Plane NAD 83 (Meters) and add the following two data layers:

BOUNDARY_CNTYBNDS_POLY (County Boundaries)

DEMO_COUSUB2010_POLY (Vermont Population data by town (or County Subdivision) extracted from the U.S. Census for 2010)

b) In the Table of Contents, right-click on data layer

DEMO_COUSUB2010_POLY

c) Click to select "Properties"

d) In the Layer Properties Window use the menu for each item to set variables as follows:
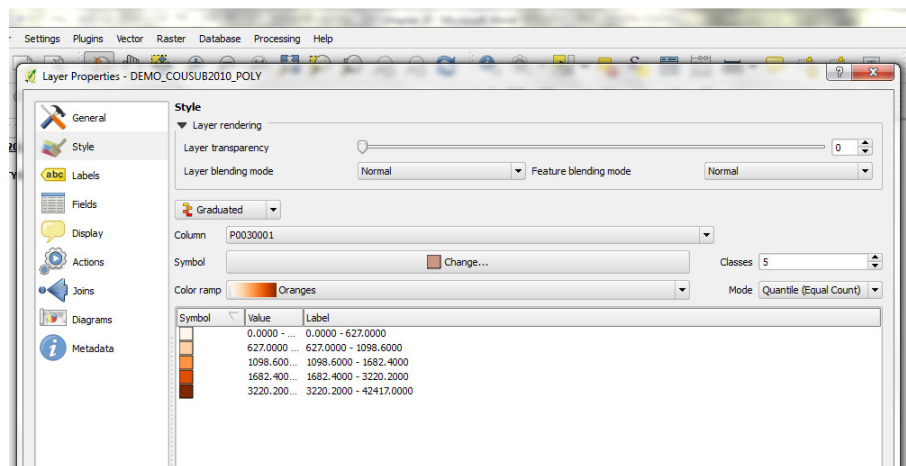
Choose **Graduated**
Column: **P0030001**
Mode: **Quantiles**
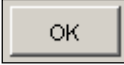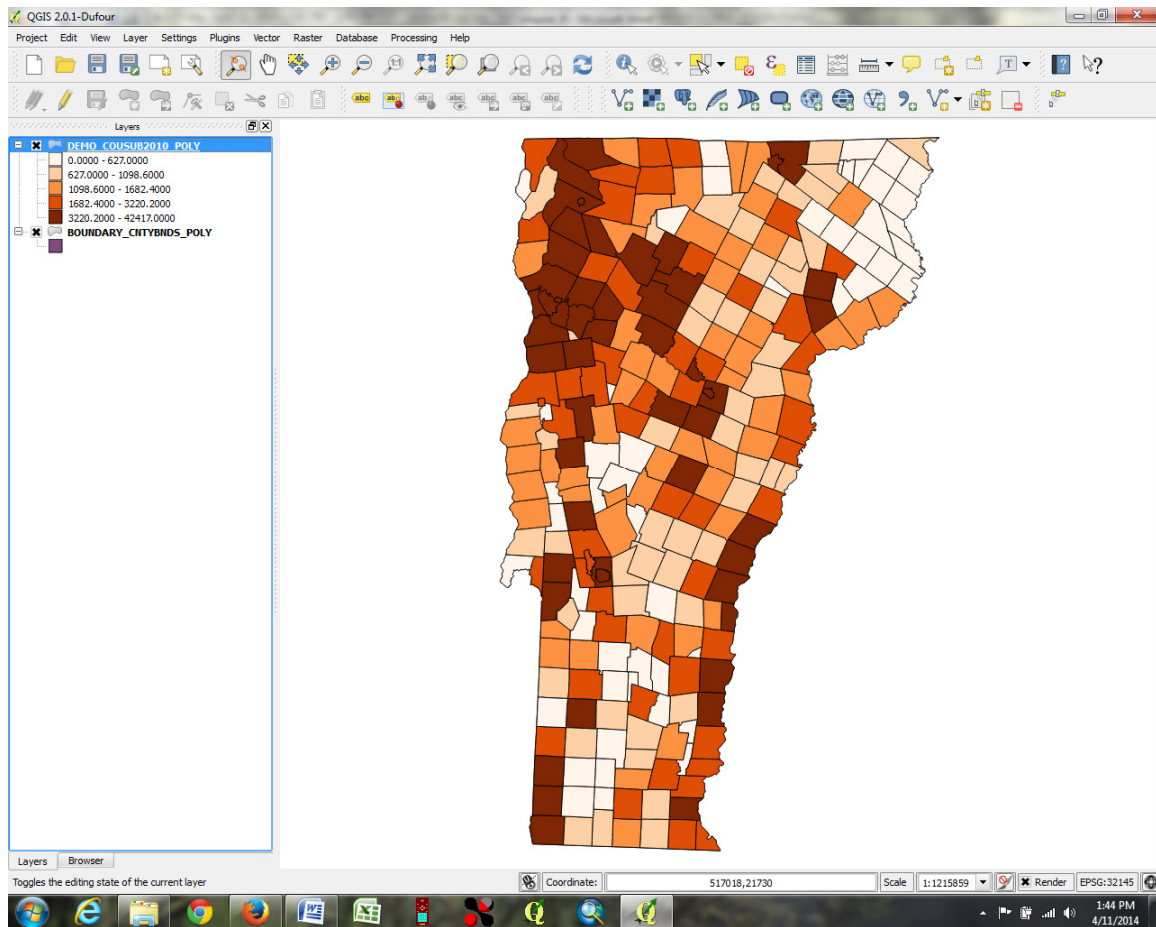Choose a color ramp
Number of Classes: **5**
Click the "Classify" button.

When Classified By **Quantile,** the number of <u>records</u> in each class are equal.

e) Click [Apply] and then [OK] to apply changes and close the Properties window.

The resulting map displays the 2010 population by Town from the US Census.

Population data is represented by five (5) classes with towns in orange having the smallest population to towns in red that have a larger population (you may have chosen a different color ramp)

The Legend in the Table of Contents, and the Properties window describe this data showing how the actual breakdown occurs by class as we saw in the Properties window.

Try changing the Mode to see how the map changes!

Adding Labels

Labeling data in the Map View helps add more information to the map. We can add labels using the Properties window for data layers.

a) Right click on the BOUNDARY_CNTYBNDS_POLY and choose Properties

b) Use the menu for each item to set variables as follows:

> Label this layer: **click to put X in box**
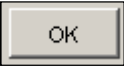> Field with labels: **CNTYNAME**
> Click on Buffer: **click to put an X in the "Draw text buffer" box**

> Leave all other fields the same, but take a look at the variety of formatting and placement options. Then Click OK.

Intro to GIS, VT Geo. Data, and QGIS (2014)
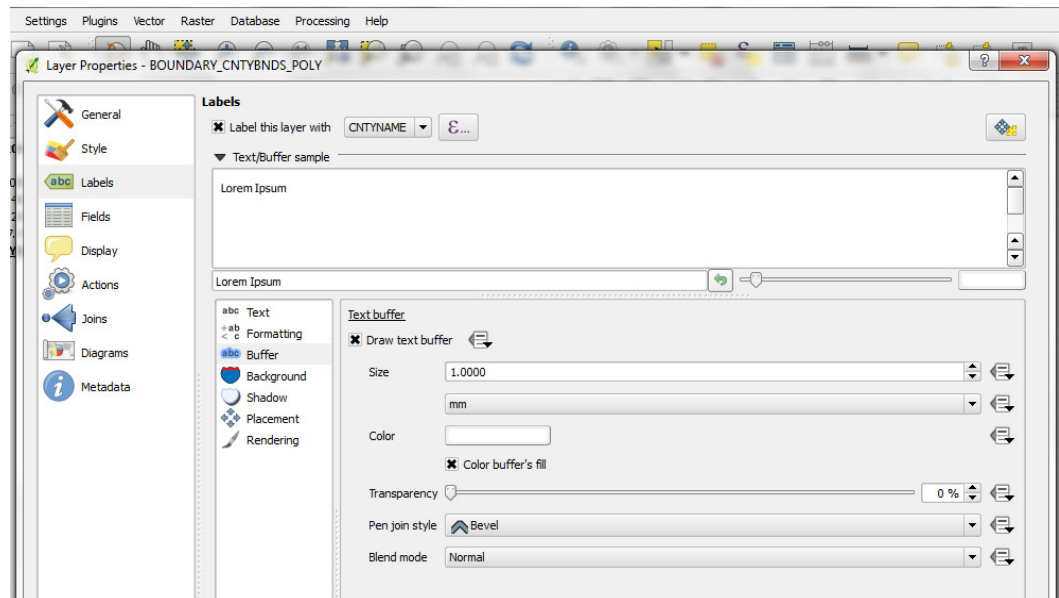
Improving The Appearance of the Map

Why can't we see that County layer (other than the labels)? We need to move it so that it is drawn above the population layer and change its symbology so that it adds useful information to the map.

a) Left Click on the COUSUB2010 layer and drag it down in the Table of Contents so it is below the CNTYBNDS layer.

b) Open the Layer Properties window for the CNTYBNDS layer

c) Click on Simple Fill

d) Change Fill Style to "No Brush"

e) Change the Border color so that it is green

f) Change Border width so that it is .6

g) Click [OK] to accept changes and close the window.

Intro to GIS, VT Geo. Data, and QGIS (2014)
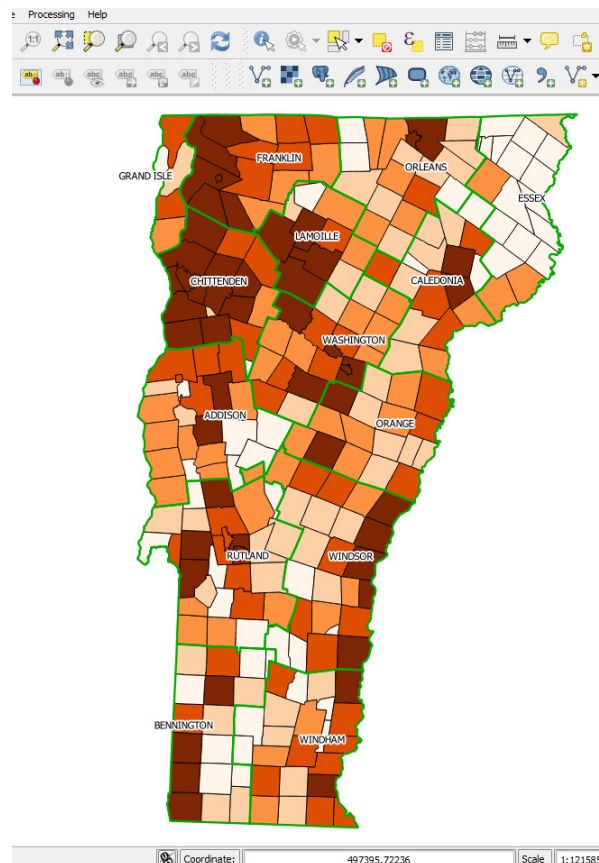
Understanding Scale Dependency

When viewing the data layers and County labels at the Full Extent (approximately 1:1,200,000 scale depending on window size on the screen) labels appear clear and well placed for the 14 counties of Vermont.

What happens when you zoom in on the map?

Can we adjust the way labels are drawn on the map to account for changes in scale?

1. **Zoom In and Changes in Extent / Scale**

   a) Zoom in anywhere on the map.

   b) Use the Zoom and Extent tools to move between extents and scales to observe how County labels become less useful when zooming in on the map.

   c) Click to return to the Full Extent before starting the next task.

2. **Changing Properties for the County Boundaries and Labels**

   a) Right Click on BOUNDARY_CNTYBNDS_POLY and open the Properties Window and click to the Labels section.
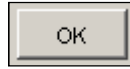
   b) Click on Rendering .

   We can set the scale properties for this layer to only show labels at specific scales.

   c) In the "Scale-base visibility" box click the check box then set the Minimum value to 350,000.

   Leave all other fields the same.
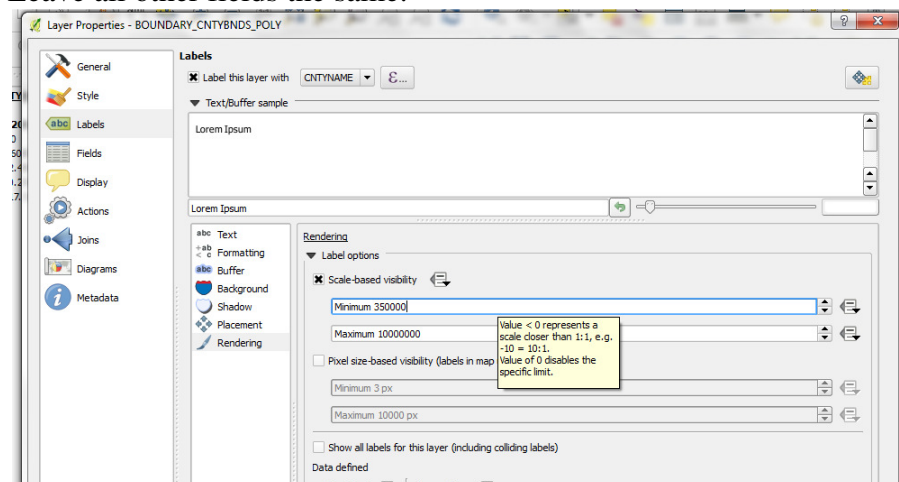
The county labels will only display when we are zoomed out farther than the scale of 350,000.

d) Click [OK] to apply changes and close the Properties window

At Full Extent (approximately 1:1,200,000 scale depending on the window size on your screen) county labels should be visible.

e) Zoom in on the map using the Zoom In tool watching the scale in the status bar at the bottom of the screen until you have zoomed in closer than 1:350,000.

County labels should disappear.

f) Zoom back to the Full Extent to verify that labels return and note the scale in the status bar.


3. **Town Labels**

Adding Town Names will improve the map.

a) Right Click on DEMO_COUSUB2010_POLY open the Properties window
b) Click on the Labels tab to open the Label settings window.
c) Click the box next to "Label this layer with" to put an X in it and choose Name10
d) Click on Rendering, and in the "Scale based Visibility" area, click on the box to enable and type 350,000 in the "Maximum" box.
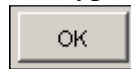
e) Click [OK] to close the Layer Labeling settings window.

f) Change the scale by typing 349,000 in the scale box at the bottom of the map to zoom to the scale 1:349,999. Roads and Town Names should be visible.
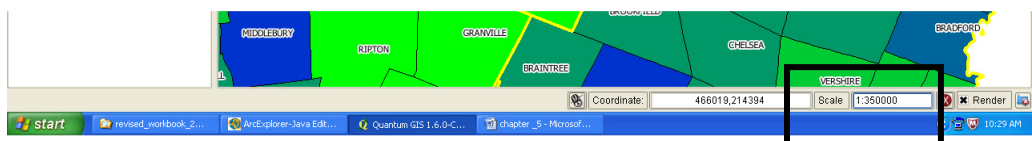
f) Zoom out farther than 1:350,000 scale and only County Names should be labeled, and roads should disappear.